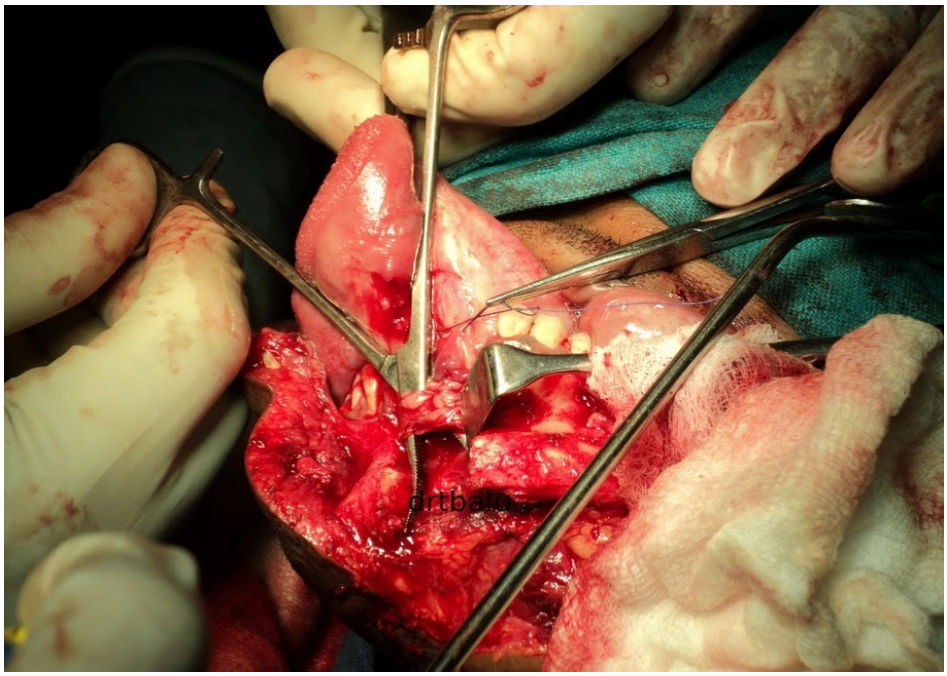
Mandibular swing approach

A Step By Step Approach

Dr T Balasubramanian



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Introduction:

The mandibular swing approach provides excellent exposure for the surgical treatment of benign / malignant lesions involving the oral cavity, oropharynx and the parapharyngeal space. The advantages of this procedure include:

1. It provides minimal cosmetic and functional disability
2. The reconstruction is rather simple and does not involve complex procedures.
3. The oncological principle of this procedure is also rather sound. Studies performed by Marchetta et al have clearly shown that periosteum of mandible is not involved when there is normal tissue existing between the tumor and the mandible. This can be clearly assessed preoperatively by performing accurate biopsy of the lesion and marking the margins.

History of the procedure:

Roux in 1836 described this surgical technique. Sedillot used the same procedure in 1844 to remove an intraoral mass. In 1862 Billroth first performed segmental resection of mandible in order to gain access into the oral cavity. After Billroth this procedure was largely forgotten till 1959 when head and neck oncology group of Sloan-Kettering cancer hospital again popularized this procedure. It was only after Spiro's publication of his successful report following this procedure others started to follow suit.

Surgical technique:

The technique used in present day mandibular swing approach was the one popularized by Spiro. This procedure is ideally performed under general anesthesia. Prelimiary tracheostomy should be performed because extensive intra oral oedema following surgery will compromise airway during early post op phases. Endotracheal tube intubation is performed via the tracheostome and the tube is anchored to the chest. A nasogastric tube should be introduced before surgery.

Figure showing endotracheal tube intubated via tracheostome

Incision:

The vertical component of the incision starts from the vermilion border of lower lip directly extending downwards up the chin. From just below the chin the incision takes a gentle lateral curve at the level of the hyoid bone to extend up the medial border of sternomastoid muscle.

Figure showing the incision marked

The lower lip is divided up to its full thickness. The inferior labial artery could start bleeding during this stage and should be secured.

The neck incision should always be carried out in the subplatysmal plane in order to avoid injuring the marginal mandibular branch of facial nerve. The deep cervical fascia enveloping the submandibular gland should also be incised.

The mandibular periosteum is incised over the mandibular sympysis area. It is evelated for about 2 cms on both sides.

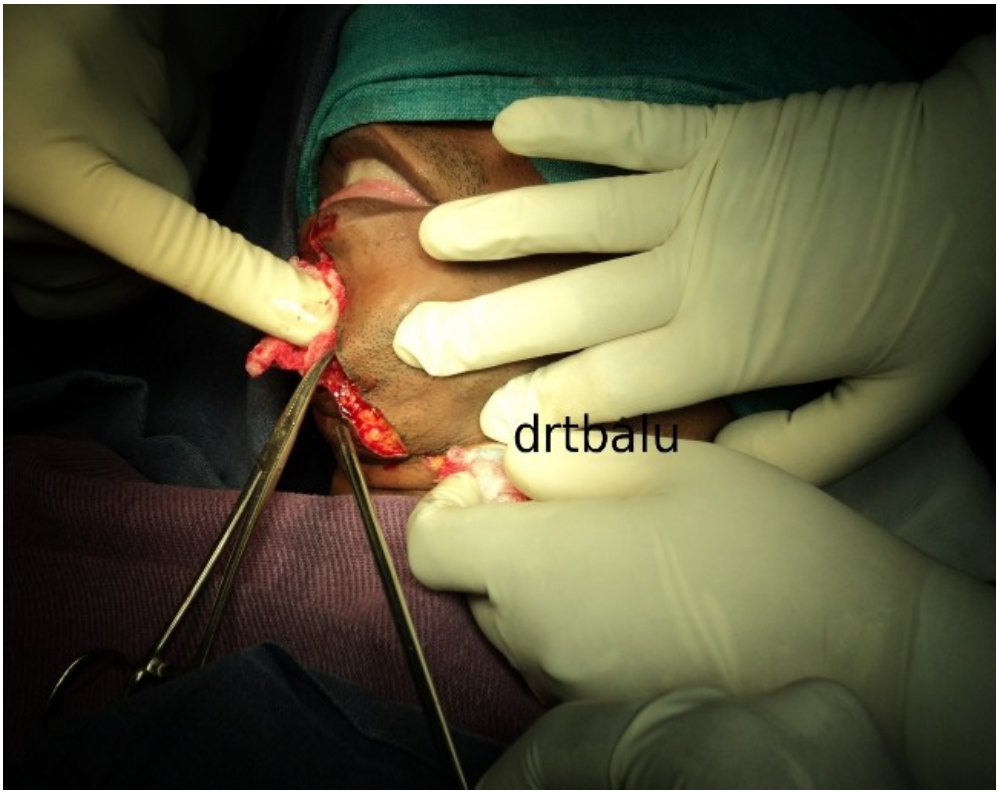


Figure showing incision

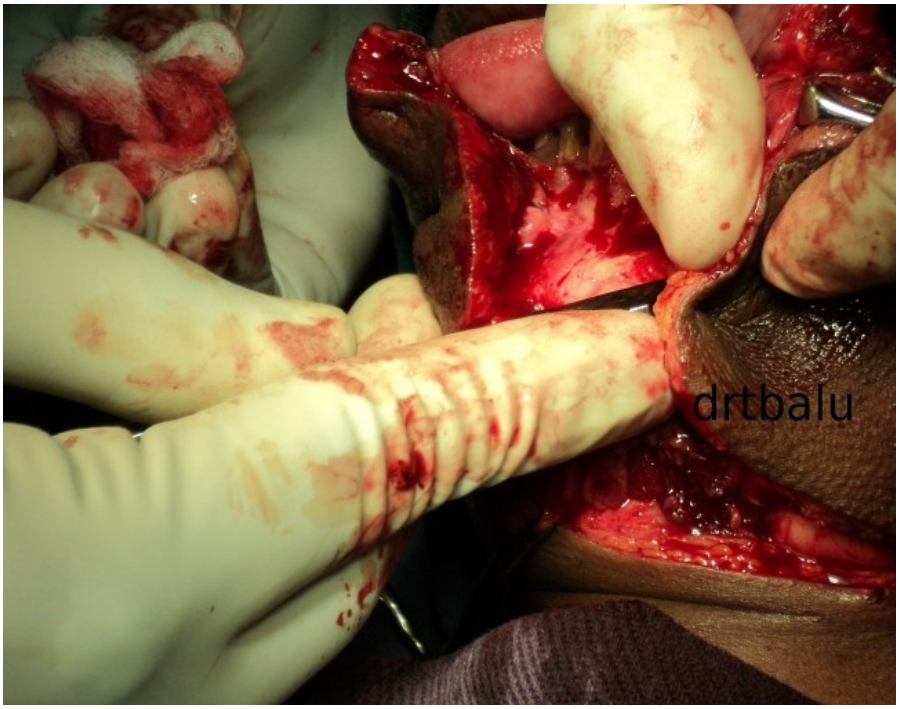


Figure showing mandibular periosteum being stripped

Mandibular osteotomy:

This is performed in the midline. This is usually performed using a fissure burr / Gigli saw in a stepwise pattern. This small step at the site of osteotomy helps is locking up the fragments of the mandible when wiring / plating is done after surgery is over. Paramedian osteotomy can be performed as a small variation between the lateral incision and canine teeth. This paramedian osteotomy provides reasonable access into the oral cavity without causing damage to digastric and genioglossus muscles thus preventing potential muscle necrosis and potential dead space formation.

Figure of mandible showing the step osteotomy marked

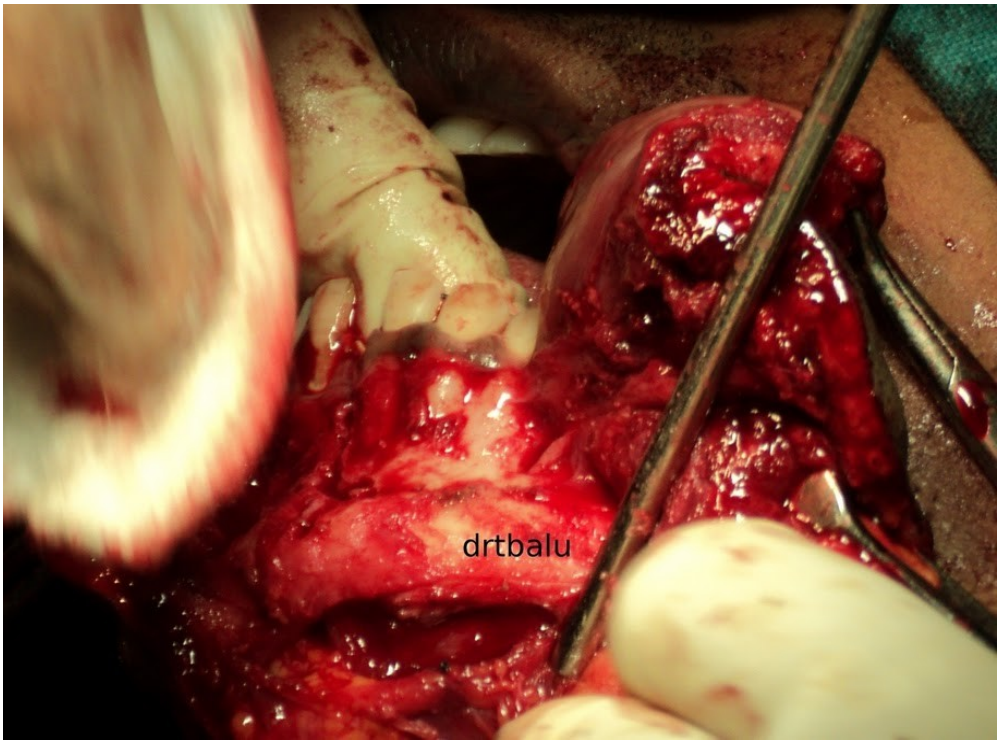


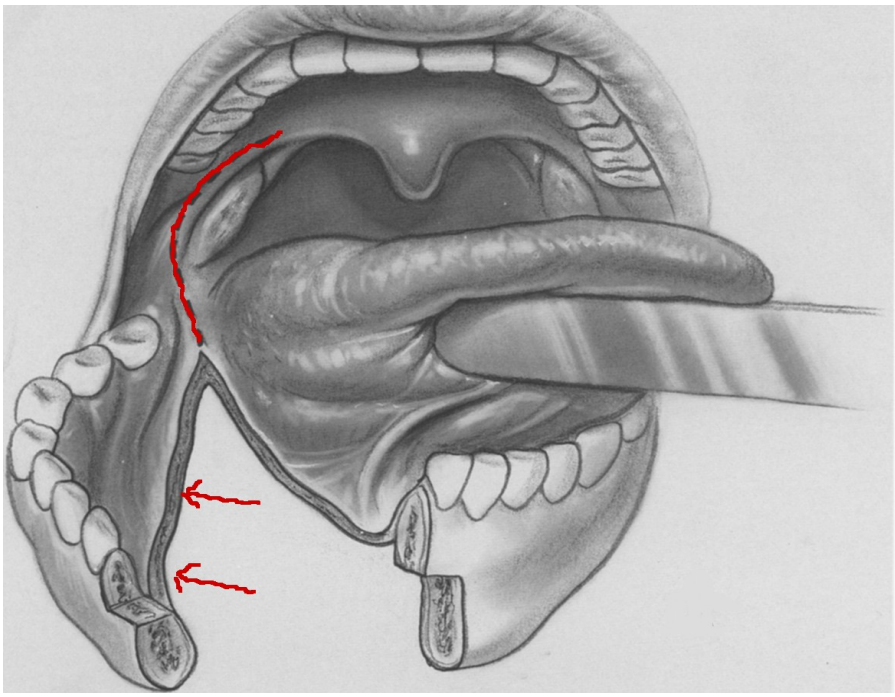
Figure showing stepped midline osteotomy performed on the mandible

Intraoral procedure:

This is the next step. It is performed by making a paralingual intraoral incision. This incision continues in the paralingual gutter extending up to the anterior tonsillar pillar. It can be extended upwards to reflect the soft palate also if need arises for a better exposure. Adequate cuff should be left in the paralingual area to make reconstruction easy.

It is always better to identify, dissect the wharton's duct and reflect it along with the swung mandible. This when done early during the intra oral procedure will help in preventing the late complication arising due to blocked wharton's duct.

If exposure is not adequate then lingual nerve can be transected. A sincere attempt should be made to reanastomose the nerve during closure.



Intra oral incision is marked. Red arrow shows the liberal amount of tissue left medial to the mandible which could make reconstruction easy

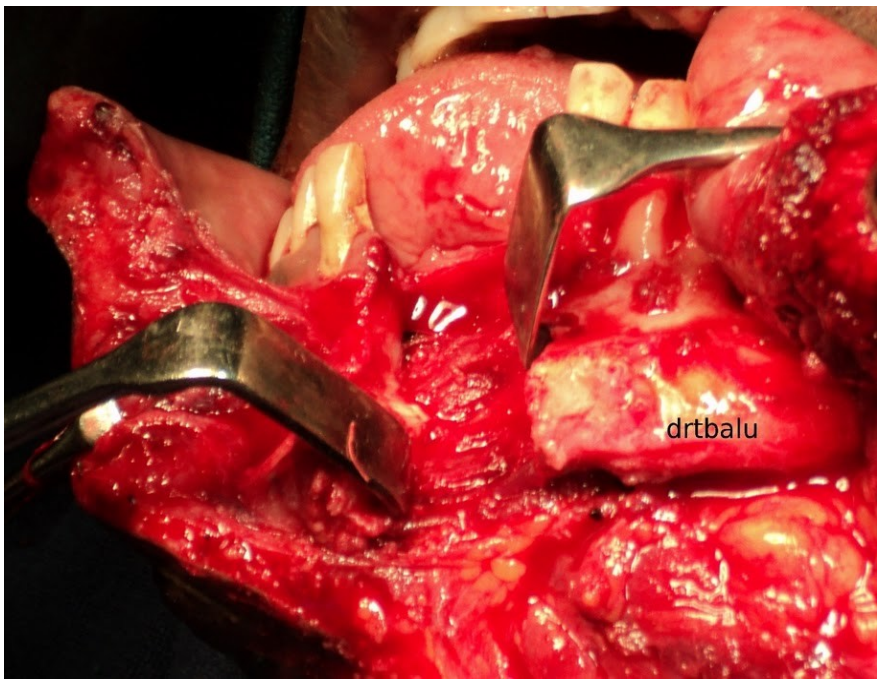


Figure showing the status immediatly after midline splitting of mandible. Note the geniohyoid muscle is still intact

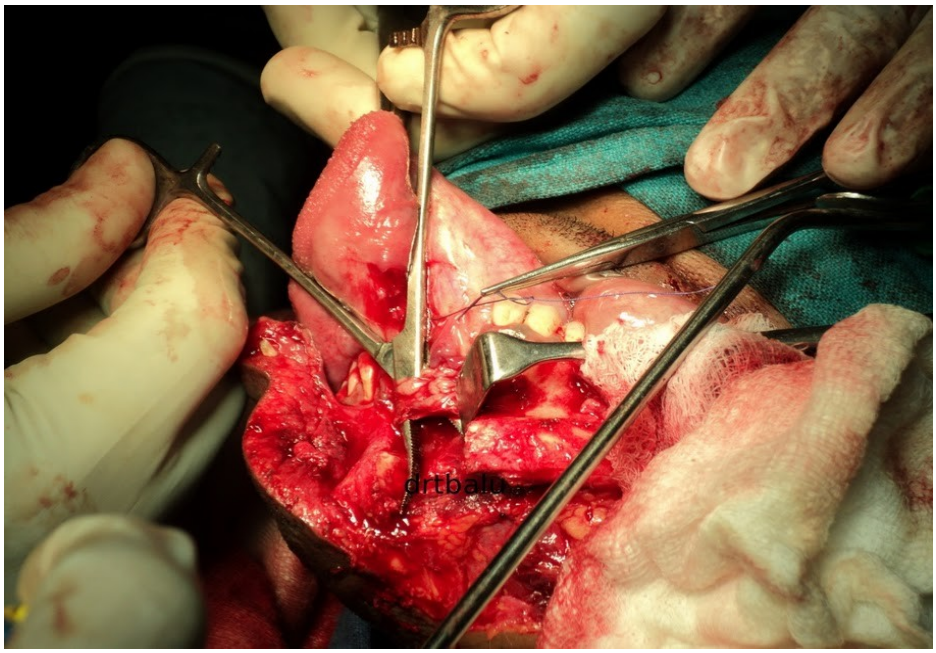


Figure showing the begining of intraoral dissection. Note the Wharton's duct has been separated and held apart using proline. This helps in its identification during repair.

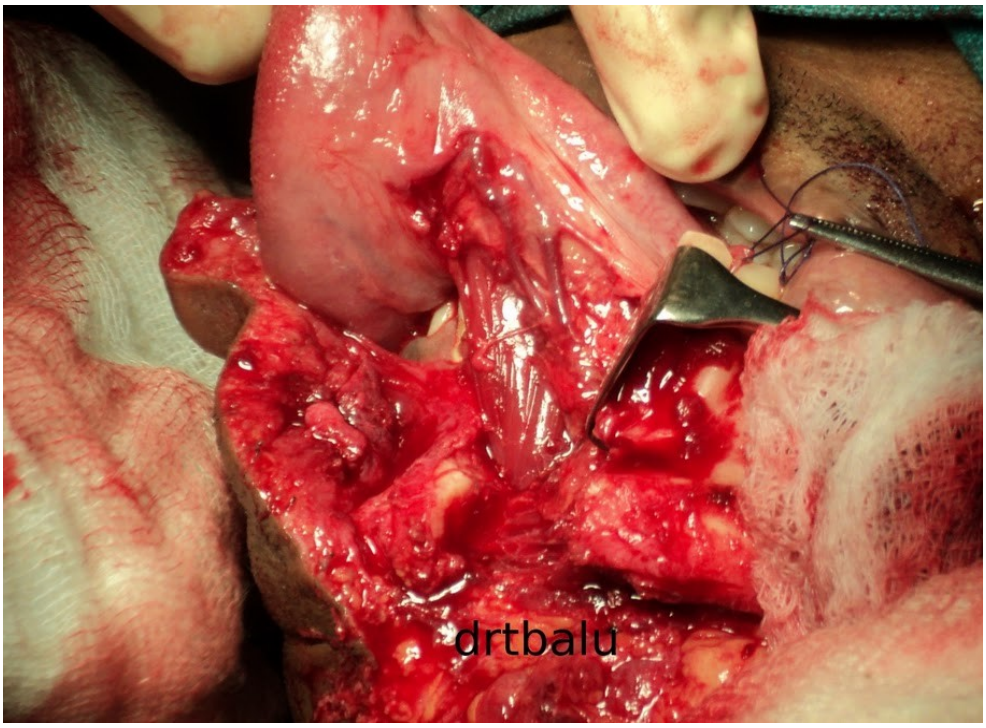
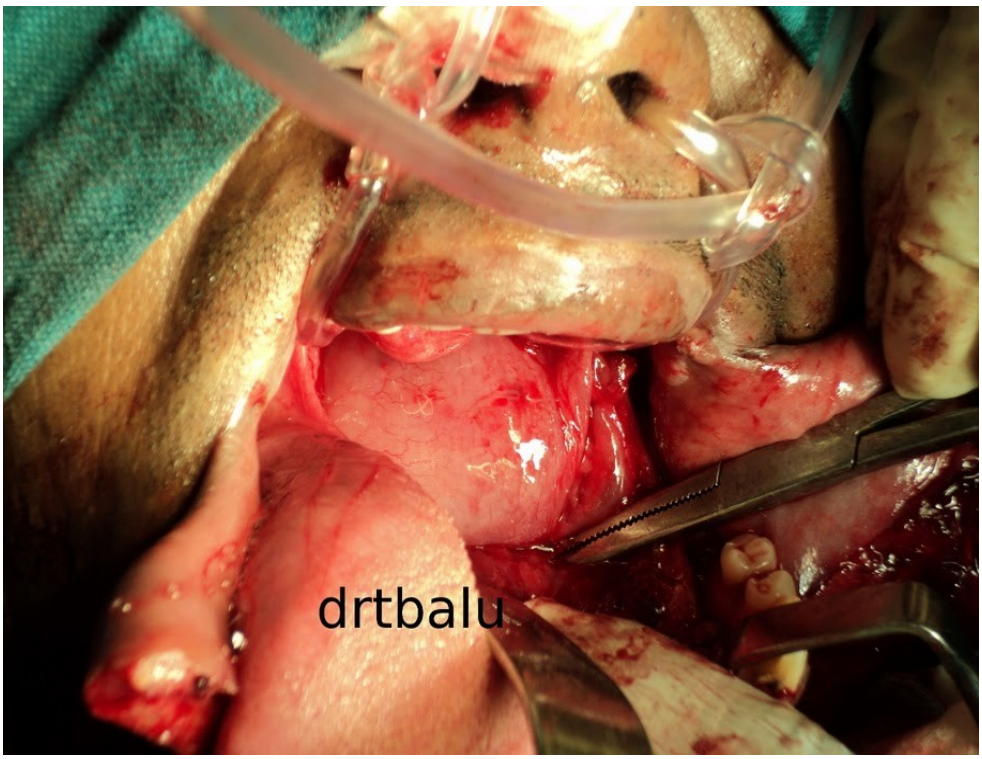


Figure showing intact lingual vessels and Hyglossus muscle



Tumor mass clearly seen after mandibular swing is complete

Mandibular fixation:

This step should be carried out after intraoral incison has been closed adequately using chromic catgut or other monofilament sutures. As a first step a mandibular reduction forceps is used to hold the mandible fragments together. Stabilization can be achieved either by using plate and screws or wiring. If plate and screws are planned to be used during fixation it is imperative to fashion the plate in such a way that it would hug the contour of the mandible before proceeding with mandibulotomy. It is also better to make holes even before mandibulotomy as this would ensure accurate reduction and fixation later.

Figure showing reduction forceps

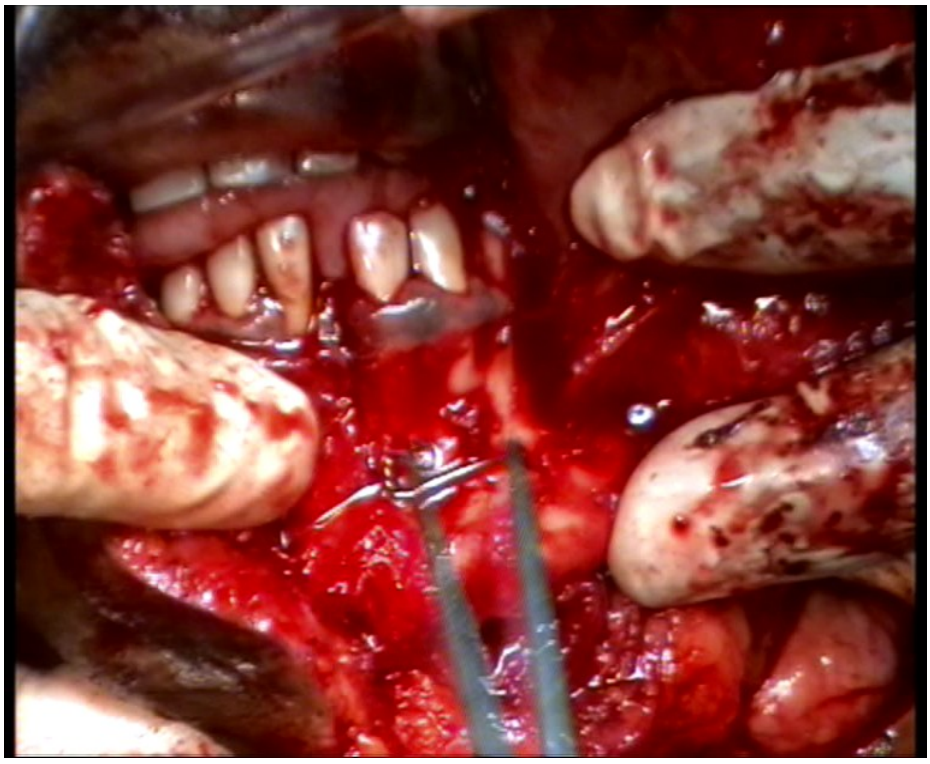


Figure showing mandibular fragments after stabilization with wires

The skin wound is closed ideally in two layers.

Image after skin closure

Complications:

1. Injury to the marginal mandibular nerve if the dissection is not performed under subplatysmal plane
2. Injury to Wharton's duct leading to post operative sialadenitis of submandibular gland
3. Injury to lingual artery
4. Injury to lingual nerve

5. Non union / Mal union of mandible
6. Wound infection
7. Osteomyelitis
8. Plate exposure / plate fracture